Quiz 2 Saved

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Quiz 2

MATH 242L Calculus II

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Below, please find the most general antiderivative. Show all work for full credit. And remember that you can always check your final answer!

1. (1 point for answer, 3 for work shown)

$u = x^3 + 1$

$du/dx = 3x^2$ ✓

$du = 3x^2 dx$ ✓

$$\int x^2 (x^3+1)^{17} \, dx = \frac{1}{3} \int u^{17} \, du$$

$$= \frac{1}{3} \cdot \frac{1}{18} u^{18}$$

$$= \frac{1}{3} \cdot \frac{1}{18}(x^3+1)^{18}$$

Exactly. +4

2. (1 point for answer, 3 for work shown)

$u = \sin^4 x$

$du/dx = 4\cos^3 x$

$du = 4\cos^3 x \, dx$

$$\frac{1}{4}\int \sin^4 x \cos x \, dx$$

$\frac{1}{4}\int u \, du$

$\frac{1}{4} \cdot \frac{1}{2} u^2 \, du$

$\cdot \frac{1}{8} u^2$

$\frac{1}{8}(\sin^4 x)^2$

$\sin \cdot \sin \cdot \sin \cdot \sin$

I couldn't figure out how, but I assumed $\cos(x)$ cancelled somehow

↑

Alas, this is sort of what you can run into with the "wrong" choice of u

Try $u = \sin x$ . . .

+1

3. (1 point for answer, 3 for work shown)

$$\int \sqrt{1-2x}\, dx$$

$u = 1-2x$ ✓

$du/dx = -2$ ✓

$du = -2\, dx$

$-\dfrac{1}{2}\int (1-2x)^{\frac{1}{2}}\, dx$

$-\dfrac{1}{2}\int (u)^{\frac{1}{2}}\, du$

$-\dfrac{1}{2}\cdot\dfrac{2}{3} u^{\frac{3}{2}}$ ✓

$-\dfrac{1}{3} u^{\frac{3}{2}}$

So close!

+3

$$= -\dfrac{1}{3}(1-2x)^{-\frac{3}{2}} + C$$